

Species Composition of Ants (Hymenoptera: Formicidae) in Potohar Plateau of Punjab Province, Pakistan

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Abstract.- Taxonomic work on ants has been badly neglected in Pakistan. Partially to redress this, adults of ants were collected from various localities of Potohar plateau of Punjab province, Pakistan during 2009-2010. Collection surveys revealed 21 species in 13 genera and 3 subfamilies. All the species are first time recorded from Pakistan. For each recorded species collection details along with habitat information is provided.

Key words: Ants, Formicidae, Potohar, Punjab.

INTRODUCTION

Ants are social insects that belong to family Formicidae of order Hymenoptera. They are known to appear about 120 million years ago (Ward, 2007). Depending upon specific variations they may have green, black, red or metallic body (Agosti *et al.*, 2000). They are hemimetabolic insects having versatile importance. They are soil turners, indicators for the conditions of ecosystem, predators, pollinators and scavengers to important component of food chain (Bharti, 2011; Hanzawa *et al.*, 1988; Holldobler and Wilson, 1998; Defoliart, 1999; Aslam *et al.*, 2006). They are used to collect seeds of herbal tea in South Africa (Downes and Laird, 1999). Army ants are used as surgical sutures in Africa and South America (Gottrup and Leaper, 2004). In contrast to advantages, ants may be detrimental and act as pests (Bharti, 2011). Bullet ants are considered to have most painful sting of any insect (Clarke, 1986). Fire ants under genus *Solenopsis* are unique in having poison sac with piperidine alkaloids (Obin and Van der Meer, 1985). Their stings are painful and can be dangerous to hypersensitive people (Stafford, 1996).

More than 12000 species of ants are reported worldwide with further expected numbers of species up to 22000 (Rabeling *et al.*, 2008). They are known

under 296 genera, 16 subfamilies and a single family *i.e.* Formicidae (Bolton, 1994). Among these one forth species occur in Asia (Ogata, 1992). Pakistan occupies an important geographic position. It represents Palearctic, Ethiopian and Oriental fauna. Taxonomic studies on ants have never been initiated formally in Pakistan. Uptill now only two studies have been carried out in this part of the world, among these, study by Bingham (1897) was carried out before partition of sub-continent. However since partition only Umair (2010) worked over taxonomy of ants in Pakistan, yet his study was limited to only two districts of Punjab province. Keeping in view the above facts it can be safely said that there is big lacuna regarding actual species composition of ants of Pakistan. It was therefore planned to study ant species of Potohar plateau of Punjab province as starting point to explore ant fauna of the country.

MATERIALS AND METHODS

Surveys were carried out throughout Potohar Plateau of Punjab province, Pakistan during the year 2009-2010 (Fig. 1a and b). Ants were collected from variable habitats including cereal crops, vegetables, grass fields, under soil, road side, trees, ornamental plants, residential and official buildings, sugar godowns and from plants attacked by aphids and mealy bugs. Collection was done at day time as well as night catches were made. Ants were collected through aspirator, collected specimens were killed in 75% ethanol. After bringing to laboratory

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0030-9923/2012/0003-0699 \$ 8.00/0

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specimens were mounted on triangular cards. They were identified up to lowest possible taxa following taxonomic literature by Bingham (1897), Bolton (1994) and Umair (2010). Identified specimens were deposited at Biosystematics laboratory, Department of Entomology, Pir Mehr Ali Shah Arid Agriculture University (PMAS-AAU), Rawalpindi.

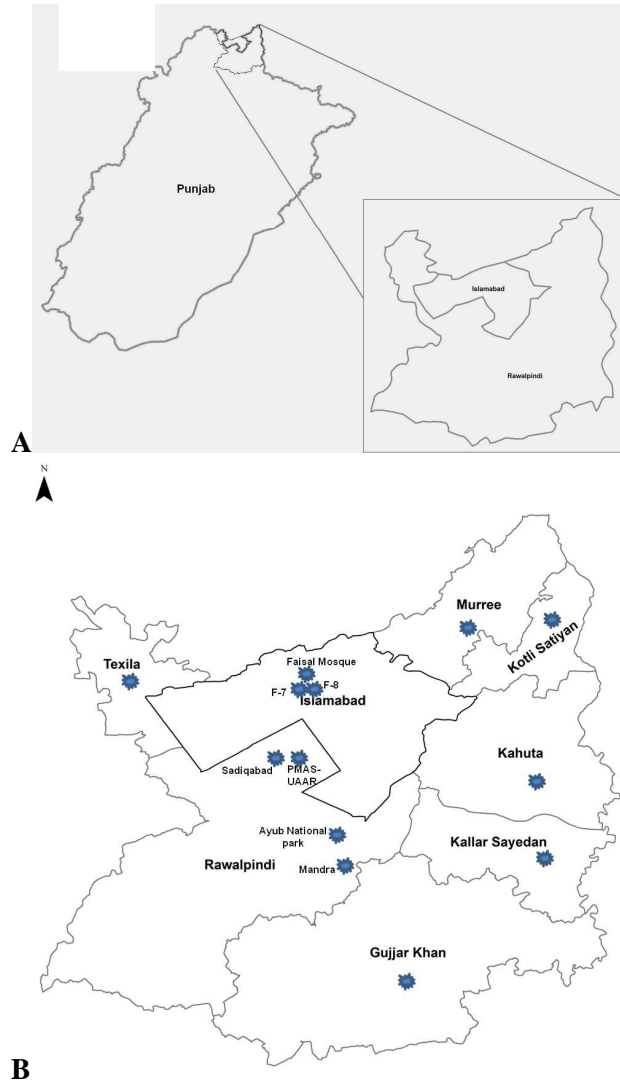


Fig. 1. A, Potohar plateau (Punjab Province, Pakistan); B, Localities visited in Potohar Plateau for collection of ants

RESULTS

As a whole 21 species under 13 genera and 3 subfamilies of family Formicidae were studied.

Details for the explored fauna is as below.

Subfamily: Myrmicinae

Genus: *Holcomyrmex* Mayr, 1879

Holcomyrmex scabriceps Mayr, 1878

Material examined

Rawalpindi: Ayub park, 20.X.2009, leg. Zia, 02 workers; Taxila, 14.VIII.2009, leg. Umair, 03 workers; Gujjar Khan, 12.IX.2009, leg. Zia, 04 workers; Kahuta: 25.V.2009, 05 workers, leg. Zia.

Comments

Specimens were collected from residential buildings, grass lands and from branches of *Acacia* and *Dalbergia sissoo*.

Holcomyrmex glaber Andre, 1833

Material examined

Rawalpindi: Ayub park, 2 workers, 20.X.2009; Taxila, 03 workers, 14.VIII.2009; Gujjar Khan, 04 workers, 12.IX.2009.

Comments

Collected from a school building and from *Acacia* and *Dalbergia sissoo* trees.

Genus *Pheidole* Westwood, 1840

Pheidole nietneri Emery, 1901

Material examined

Rawalpindi: Ayub park: 14.VIII.2009, leg. Zia, 4 workers, 20.X.2009, leg. Umair, 2 workers; Taxila, 14.VIII.2009, leg. Umair, 03 workers; Mandra, 20.X.2009, leg. Naeem, 05 workers; Gujjar Khan, 12.IX.2009, leg. Zia, 04 workers; Islamabad: Faisal Mosque, 01.X.2009, leg. Umair, 05 workers; Kahuta: 25.V.2009, leg. Zia, 05 workers; Kallar Sayedan, 08.III.2009, leg. Tariq, 03 workers; Kotli Satiyan, 26.X.2009, leg. Tariq, 04 workers; Murree, 19.X.2009, leg. Zia, 05 workers.

Comments

Specimens were caught from grasslands, fields of maize and wheat, apple orchards, from twigs attacked by aphids and mealy bugs, poultry farms.

Pheidole pronotalis Forel, 1902*Material examined*

Rawalpindi: Ayub park, 20.X.2009, leg. Umair, 02 workers, 14.VIII.2009, leg. Zia, 04 workers; Islamabad: F-7 Park, 01.X.2009, leg. Zia, 05 workers.

Comments

Recorded from grasslands, fields of maize and wheat, garbage heaps, along roadside and walking tracks in public parks.

Pheidole mus Forel, 1902*Material examined*

Rawalpindi: Ayub park, 20.X.2009, leg. Umair, 01 worker, 14.VIII.2009, leg. Zia, 05 workers; Islamabad: F-7 park, 01.X.2009, leg. Zia, 05 workers.

Comments

Specimens were collected early in the morning from different garbage heaps of the Islamabad and from grassy vegetation in a park.

Genus *Monomorium* Mayr 1855*Monomorium longi* Forel, 1902*Material examined*

Islamabad: F-8 park, 01.X.2009, leg. Zia, 05 workers.

Comments

Recorded from apple orchards and pine trees.

Monomorium schurri Forel, 1902*Material examined*

Rawalpindi: Ayub park, 04.VIII.2009, leg. Umair, 04 workers, 20.X.2009, leg. Zia, 02 workers; Islamabad: F-7 park, 01.X.2009, leg. Umair, 05 workers.

Comments

Recorded from the margins of water lake in Rawalpindi and from pine trees.

Genus *Meranoplus* Smith, 1853*Meranoplus bicolor* (Guerin-Meneville, 1844)*Material examined*

Rawalpindi: Ayub park, 20.X.2009, leg. Zia, 02 workers, 14.VIII.2009, leg. Umair, 04 workers, Murree, 19.X.2009, leg. Zia, 05 workers; Kaller Sayedan, 08.III.2009, leg. Tariq, 03 workers; Islamabad: Faisal mosque, 01.X.2009, leg. Zia, 05 workers, Kotli Satiyan: 26.X.2009, leg. Naeem, 04 workers.

Comments

Recorded from grassy pastures, fields of maize and wheat, apple orchards and pine trees.

Genus *Solenopsis*, Westwood 1840*Solenopsis geminate* Fabricius, 1804*Material examined*

Islamabad: Kotli Satiyan, 26.X.2009, leg. Zia, 04; F-8 Park, 01.X.2009, leg. Zia, 05 workers; Kahuta: Naramator, 25.V.2009, leg. Zia, 05 workers; Rawalpindi: Murree, 19.X.2009, leg. Umair, 05 workers.

Comments

Specimens were collected from grasses, pine trees, shrubs and along road side.

Genus *Atopomyrmex* Andr, 1889*Atopomyrmex ceylonicus* Emery, 1901*Material examined*

Rawalpindi, Ayub park, 14.VIII.2009, leg. Umair, 04 workers, Kaller Sayedan, 08.III.2009, leg. Tariq, 03 workers.

Comments

Specimens were collected from residential buildings (From Lawn area and in Kitchens while feeding on dead cockroaches and bread pieces).

Genus *Crematogaster* Lund, 1831*Crematogaster rothneyi* Mayr, 1879*Material examined*

Rawalpindi: Saddaqabad, 28.V.2010, leg.

Zia, 01 worker, Ayub park, 20.X.2009, leg. Zia, 02 workers, Taxila, 14.VIII.2009, leg. Umair, 03 workers, Mandra, 20.X.2009, leg. Tariq, 05 workers, Gujar Khan, 12.IX.2009, leg. Tariq, 04 workers, Kaller Sayedan, 08.III.2009, leg. Naeem, 03 workers; Islamabad: Kotli Sattiyani, 01.X.2009, leg. Zia, 07 workers; Kahuta: Pinjar, 25.V.2009, leg. Zia, 05 workers.

Comments

Recorded from grasslands, fields of maize and wheat, apple orchards and pine trees.

Genus *Tetramorium* Mayr, 1855
Tetramorium smithi Mayr, 1879

Material examined

Islamabad: Kotli Sattiyani, 26.X.2009, Leg. Tariq, 04 workers, F-8 park, 01.X.2009, leg. Zia, 05 workers; Rawalpindi: Murree, 19.X.2009, leg. Zia, 05 workers.

Comments

Specimens were recorded from fields of maize and wheat, apple orchards and pine trees.

Subfamily Camponotinae
Genus *Lepisiota* Santschi, 1926
Acantholepis frauenfeldi (Mayr, 1855)

Material examined

Rawalpindi: Saddaqaabad, 28.V.2010, leg. Umair, 1 worker, Ayub park, 20.X.2009, leg. Zia, 02 workers, Taxila, 14.VIII.2009, leg. Zia, 03 workers, Murree, 24.X.2009, leg. Umair, 04 workers, Mandra, 20.X.2009, leg. Tariq, 05 workers, Gujar Khan, 12.IX.2009, leg. Tariq, 04 workers, Kaller Sayedan, 08.III.2009, leg. Naeem, 03 workers; Islamabad: F-7 park, 01.X.2009, leg. Zia, 07 workers, Kotli Sattiyani, 16.X.2009, leg. Tariq, 05 workers; Kahuta: Naramator, 25.V.2009, leg. Zia, 05 workers.

Comments

Specimens were collected from dead leaves fallen on ground, grasses, different flowers and branches of ornamental trees.

Genus *Polyrhachis* Swainson and Shuckard, 1840
Polyrhachis hodgsoni Forel, 1902

Material examined

Islamabad: Kotli Sattiyani, 16.X.2009, leg. Zia, 05 workers.

Comments

Specimens were collected from a Chinese ornamental plant, pine trees, grassy pastures, ornamental trees, rose plants and from fallen eatables near a busy bus stop.

Genus *Camponotus* Mayr, 1861
Camponotus confucii Forel, 1894

Material examined

Rawalpindi: Saddaqaabad, 28.V.2010, leg. Umair, 01 worker, PMAS-AAU campus, 30.IX.2009, leg. Zia, 01 worker, Ayub Park, 20.X.2009, leg. Zia, 02 workers, Taxila, 14.VIII.2009, leg. Umair, 03 workers, Mandra, 20.X.2009, leg. Naeem, 05 workers, Gujar Khan, 12.IX.2009, leg. Tariq, 04 workers.

Comments

Recorded from grassland, footpath and from bare soil (without any vegetation).

Camponotus sericeus Fabricius, 1798

Material examined

Rawalpindi: Ayub park, 20.X.2009, leg. Zia, 02 workers, Murree, 24.X.2009, leg. Zia, 04 workers; Islamabad: Kotli Sattiyani, 16.X.2009, leg. Naeem, 05 workers, Faisal Mosque, 01.X.2009, leg. Zia, 07 workers; Kahuta, 25.V.2009, leg. Zia, 05 workers.

Comments

Specimens were collected from Chinese ornamental plants, pine trees, grassy vegetation, ornamental trees and rose plants.

Camponotus oblongus Smith, 1858

Material examined

Rawalpindi: Ayub park, 20.X.2009, leg. Umair, 02 workers.

Comments

Specimens were collected from Chinese ornamental plant, pine trees, grasslands, ornamental trees, rose plants and along footpaths of a road.

Camponotus japonicus Mayr, 1866

Material examined

Rawalpindi: PMAS-AAU campus, 30.IX.2009, leg. Umair, 01 worker, Ayub park, 20.X.2009, leg. Zia, 02 workers, Taxila, 14.VIII.2009, leg. Tariq, 03 workers, Saddaqaabad, 28.V.2010, leg. Zia, 01 worker, Mandra, 20.X.2009, leg. Tariq, 05 workers, Gujar Khan, 12.IX.2009, leg. Tariq, 04 workers, Kaller Sayedan, 08.III.2009, leg. Naeem, 03 workers, Murree, 24.X.2009, leg. Zia, 04 workers; Kahuta: Pinjar, 25.V.2009, leg. Zia, 05 workers; Islamabad: Kotli Sattiyan, 16.X.2009, leg. Zia, 05 workers, Faisal Mosque, 01.X.2009, leg. Umair, 07 workers.

Comments

Collected from dead fallen leaves, grasslands, footpaths, on bare soil and branches of plants attacked by aphids.

Camponotus compressus Fabricius, 1787

Camponotus maculates Fabr, 1892

Material examined

Rawalpindi: Ayub park, 20.X.2009, leg. Zia, 02 workers, Taxila, 14.VIII.09, leg. Umair, 03 workers, Gujar Khan, 19.X.2009, leg. Umair, 04 workers; Kahuta: Naramator, 10.IX.2009, leg. Zia, 02 workers; Islamabad: Kotli sattyan, 21.VII.2009, leg. Zia, 03 workers, F-7 park, 01.X.2009, leg. Zia, 07 workers.

Comments

Specimens were collected from residential buildings, flowers of ornamental Chinese plant, pine trees, grasslands, rose plantation and along roadside.

Genus *Lasius* Fabricius, 1804

Lasius alienus Foerster, 1850

Material examined

Rawalpindi: Saddaqaabad, 28.V.2010, leg.

Zia, 03 workers, PMAS-AAU campus, 30.IX.2009, leg. Umair, 04 workers, Ayub park, 20.X.2009, leg. Umair, 05 workers, Taxila, 14.VIII.2009, leg. Naeem, 03 workers, Mandra, 20.X.2009, leg. Naeem, 05 workers, Gujar Khan, 12.IX.2009, leg. Tariq, 04 workers, Kaller Sayedan, 08.III.2009, leg. Tariq, 03 workers, Murree: 24.X.2009, leg. Zia, 04 workers; Kahuta: Pinjar, 25.V.2009, leg. Zia, 05 workers. Islamabad: Kotli Sattiyan, 16.X.2009, Leg. Zia, 05 workers, F-8 park, 01.X.2009, leg. Umair, 07 workers.

Comments

Specimens were recorded from dead leaves, grasslands, along footpaths, from branches of plants attacked by mealy bug and from sugar godowns.

Subfamily Ponerinae

Genus *Lioponera* Mayr, 1878

Lioponera longitarsus Mayr, 1879

Material examined

Rawalpindi: Saddaqaabad, 28.V.2010, leg. Zia, 03 workers, PMAS-AAU campus, 30.IX.2009, leg. Umair, 04 workers, Ayub park, 20.X.2009, leg. Zia, 05 workers, Taxila, 14.VIII.2009, leg. Tariq, 03 workers, Mandra, 20.X.2009, leg. Tariq, 05 workers, Gujar Khan, 12.IX.2009, leg. Naeem, 04 workers, Kaller Sayedan, 08.III.2009, leg. Zia, 03 workers, Murree, 24.X.2009, leg. Zia, 04 workers; Kahuta: Naramator, 25.V.2009, leg. Zia, 05 workers; Islamabad: Kotli Sattiyan, 16.X.2009, leg. Naeem, 05 workers, F-7 park, 01.X.2009, leg. Zia, 07.

Comments: Collected from residential buildings.

DISCUSSION

Pakistan has an important geographical position with total area of 881,640 km². It has abundance of Oriental, Palearctic and Ethiopian fauna. Its Oriental representation of species is continuous with those of Indian Punjab and Rajasthan and Palearctic is continuous with those of Iranian Baluchistan, eastern Afghanistan and Russia (Separated by few miles) and north western and eastern China. It has a definite Ethiopian influence which runs along southern coastal areas of Sindh and eastern Mekran in Baluchistan (Qadri, 1968).

Major part of Pakistan is Palaearctic (Hindu Kush, Karakorum, western Himalaya, Sulaiman Range, North Pakistan sandy desert and western Indus Valley) while the rest of the area is Oriental (Indus River Delta, eastern Indus Valley desert, Thar desert, Rann of Kutch in southern Punjab and eastern Himalaya) and traces of Afro tropical (Ethiopian region) from southern Iran to extreme southwestern of Baluchistan. The Hindu Kush, Karakorum, and Himalaya are a major biogeographic boundary between the subtropical and tropical flora and fauna of the Indian subcontinent and the temperate-climate Palaearctic ecozone (Rafi *et al.*, 2010; Zia *et al.*, 2011). Pakistan comprises four provinces (Punjab, Sindh, Khyber Pakhtunkhwa and Baluchistan), Northern areas (Gilgit Baltistan) and Azad Jammu & Kashmir. Potohar is a plateau that comes under Punjab province and western parts of Azad Jammu & Kashmir thereby representing Oriental as well as Palaearctic fauna. It possess three major seasons *i.e.* (i) Hot weather that prevails from the month of April to June with a temperature of 110°F max, (ii) Rainy season which is spread over months of July to September with an annual average rainfall between 96cm and (iii) Cold weather that prevails during the months of October to March, when temperature falls to 40°F max. (Din Personal Communication, 2011).

Since partition of subcontinent (in 1947), in Pakistan only single taxonomic work carried out on this group is by Umair (2010). Earlier to this, only work done in this part of sub-continent (before partition) was by Bingham (1897). Above cited biogeographical and seasonal conditions emphasize the importance and possibility of ants species inhabiting this region of the world. Results revealed a record of twenty one species which highlights further scope of ant species inhabiting Pakistan.

CONCLUSION

Keeping in view the records of current study it becomes evident that there is a definite need to unveil unexplored ant fauna of the country. We can never use this important group of insect in right direction until we know its actual species composition.

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(Received 22 July 2011, revised 29 December 2011)